DOCUMENT RESUME

ED 216 815 RC 013 366

AUTHOR Provost, Julia K.
TITLE Timber Production and Its Environmental Impacts. AIO Red Paper #21.
INSTITUTION Americans for Indian Opportunity, Inc., Albuquerque, N. Mex.
PUB DATE Dec 80
NOTE 28p.

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *American Indian Reservations; Cultural Context; Ecological Factors; *Economic Factors; *Environmental Influences; *Forestry; Futures (of Society); *Lumber Industry; *Management Development; Natural Resources; Soil Conservation; Tribal Sovereignty
IDENTIFIERS Renewable Resources; *Timber Production; Tribal Management

ABSTRACT

The supply of the nation's forests is very great, and of this supply, approximately 1 1/2 percent comes from American Indian forests. Timber resources are three-fold: the slash (unusable limbs, tops, and stumps), as well as the unmarketable trees, provide wood for fuel; the sale of timber provides tribal revenue from a renewable source; and the forestry industry provides job opportunities. Cutting practices, chemicals used for thinning, logging practices, and site preparation practices prior to planting or seeding all impact on water quality, erosion, and wild life health, and because of this require intensive management practices. Certain types of timber or forested areas hold cultural significance for some tribes: the lands the timber stands on were designated as having religious meaning, herbs which grow in the forests are used for medicine, or wildlife is held sacred by the tribe. The need for the development of an indepth forestry management program for tribal forests is obvious, and it is of utmost importance that it be under tribal management and control. (AH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED216815

AIO RED PAPER # 21

OCT 1981
ERIC/CRESS
RECEIVED

TIMBER PRODUCTION
and its Environmental Impacts

PREPARED BY

JULIA K. PROVOST
AIO RESEARCHER

DECEMBER 1980

AIO

AMERICANS FOR INDIAN OPPORTUNITY
600 Second Street NW
Suite 808
Albuquerque, New Mexico 87102

LaDonna Harris, President
Maggie Gover, Program Director

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
✓ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Americans for Indian Opportunity
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

RC010336

TIMBER PRODUCTION
AND ITS ENVIRONMENTAL IMPACTS

INTRODUCTION

TIMBER RESOURCES

- There's No Fuel Like An Old Fuel
- Timber $ales
- "Wood" You Like A Job? (or Job Opportunities)

CUTTING PRACTICES

- Thinning Processes
  - Precommercial Thinning (Chemical and Mechanical)
  - Commercial Thinning
- Clearcutting vs Selection Cutting

LOGGING METHODS

SITE PREPARATION

WATER QUALITY IMPACTS

HEALTH HAZARDS AND IMPACTS

CULTURAL IMPACTS

HELP WANTED--MANAGEMENT

SILVI-WHAT? -- A SUMMARY

Table 1: Where Wood Waste has Power Potential

Table 2: Relative Erosion Hazard of Logging Areas in Relation to Site Factors

Table 3: Several Factors that Can Affect the Degree of Chemical Impact

Table 4: Environmental Impacts

END NOTES

BIBLIOGRAPHY

BLANK PAGE
DO NOT FILM

INTRODUCTION

"Earth does not belong to man, man belongs to the Earth." This slogan expressed at Spokane's Expo '74 states a fact, not an opinion. Man is ultimately tied to his environment. If we treat it well, it will sustain us and enrich our lives. If not, we will perish from the Earth."[1]

Cecil D. Andrus

The nation's limited and renewable natural resources must be used and cared for wisely if we are to meet the future needs of the country. In the United States there are approximately 0.5 billion acres of commercial forest lands.[2] Of these, 5.3 million acres represent Indian land.[3] In order to maintain control and reap the economic benefits of the Indian forest lands, greater control must be exercised. Indians can no longer rely on the federal government to manage their forest lands properly or accurately.

A 1973 General Accounting Office study reports that:

"The Bureau of Indian Affairs does not have adequate assurance that Indian forests are adequately protected and properly developed as required by law. In several areas of forestry management, Bureau field personnel are making important decisions without adequate criteria, guidelines, or sufficient resource information."[4]

In essence, the supply of the nation's timber is very great, and of this supply, approximately 1½ percent comes from Indian forests.

TIMBER RESOURCES

Let us consider the substantial worth of timber products and the ways in which these resources can be put to use.

There's No Fuel Like An Old Fuel

As the search continues for new sources of energy to replace dwindling fuel reserves, attention is zeroing in on the earliest fuel source known to man--wood.

Our nation can use wood fuel resources without touching one single lumber quality tree. After the harvest of timber a considerable amount of "slash" (unusable limbs, tops, and stumps), as well as unmarketable trees, equaling as much as two hundred tons of dead or discardable wood per acre, is left behind. This wood can be used by the nation, while at the same time providing favorable growing conditions for the top quality trees that are left standing. Sawmills also discard a large amount of wood chips and sawdust.

A draft report done by the Battelle Memorial Institute for the Environmental Protection Agency concludes that "nearly three-quarters of the wood harvested each year is lost somewhere on the trail from forest to end products. This waste is estimated to contain enough energy to replace 21 percent of the total fossil fuel used nation-wide including 50 percent of the oil and gas burned each year by U.S. utilities. In some areas of the country, such as the Northwest, there is even more energy available from waste wood than there is from all the fuels burned by the local utilities."[5] (See Table 1)

Environmentally speaking, such removal and use would benefit most forms of wildlife by creating the areas needed to boost the growth of food supplies needed for such wildlife to exist. Also, in utilizing modest procedures, the forest floor would be protected from soil erosion.

Timber $ales

During the 1970's, prices of wood products escalated rapidly and contributed to the recent high rate of inflation and the high cost of housing. Since 1970, the Producer Price Index (PPI) for lumber has increased at an average rate of approximately 14 percent annually. Although wood product prices have been falling since the beginning of 1980, most observers believe that prices will resume their upward trend as soon as the housing market recovers.[6] Since sawtimber is harvested and produced for use in building homes, furniture, etc., it is the most valuable type of wood. Therefore, the demand for such wood is so great that the United States cannot satisfy our country's demand.

According to the American Indian Policy Review Commission,

"timber has the potential for being one of the most important Indian resources for development of reservation economies...timber is a

renewable resource, and, therefore, can contribute indefinitely to tribal revenues...the total standing timber inventory in Indian country is estimated at 40 billion board feet."[7]

Indian forest lands hold timber that yields from 25 to 100 percent of tribal revenues for approximately 57 reservations. The income from stumpage (standing, marketable trees) alone was $73 million in 1974.

However, the Bureau of Indian Affairs has been negligent in managing these forest lands. It has been estimated that the dollar loss to tribes between 1970 and 1974 was approximately $25 million, and this was due to insufficient logging. To further add to the problem, the Bureau of Indian Affairs has failed to execute reforestation and thinning programs for many tribal forests. This, of course, affects the annual allowable cut (AAC) on these Indian forest lands. Curiously, the BIA, by its unyielding attitude, fails in two respects by setting the AAC too low for some forests and too high for others.[8]

Since Indian lands constitute about 5.3 million acres of commercial forest land, it is evident that timber is a resource that cannot and should not be overlooked. It is also evident that poor management of Indian forest lands is a cause of lost revenue for many tribes. This will be discussed further in this paper.

"Wood" You Like A Job? (or, Job Opportunities)

BIA forest managers have stated that the lack of forestry staff has been one of the major problems in trying to meet the harvest yield, accomplish thinning, and to harvest slash (collect the debris left after the actual cutting).

In an analysis of the Yakima Agency and the Portland Area forestry staffs, it was noted that an additional twenty-six Bureau and nine tribal employees were needed to administer the forestry program adequately on the Yakima Reservation and fully meet the trust responsibility to the tribe. According to the analysis, the additional staff needed would cost about $300,000 per year, but would provide an increase in timber income to the Indian land owners of $4.2 million.[9] The conclusion of the evaluation stated that because of the opportunities for increasing Indian employment and income (and for reducing the country's predicted shortage of timber), the Bureau should make a strong effort to accelerate timber production on Indian forest land. Speeding up this production will require an improved working plan, better financial controls, simplified timber sales procedures and additional staffing on some reservations.[10]

In "rekindling an old flame" by using wood as an energy source, the job prospects would be considerable since most of the thinning should be done manually.

CUTTING PRACTICES

Thinning Processes

Thinning is the term that applies to cuttings which are made in immature stands to aid in the growth of the remaining trees in order to increase the total wood yield. Generally, two types of thinning practices are used: precommercial and commercial.

Precommercial thinning is used to increase the timber yields by concentrating the output of the site into fewer stems per acre. This type of thinning is also an invaluable procedure for the control of mortality of timber due to insects and disease. This is accomplished either with chemicals or by mechanical methods.

The major problem with precommercial thinning is the treatment of slash. The quantity of slash created during this thinning procedure depends on the age of the stand, that is, the larger the trees, the larger the amount of slash. Treatment of the slash is essential in order to avoid water quality damage as well as to reduce the fire hazard and minimize insect infestation. (See Water Quality section).

Chemical application usually entails the use of a hand-held sprayer so that only certain species are allowed to stand. This is very effective since the concentration of chemicals used are aimed directly at the brush that hampers the growth of new trees. Chemical application on a larger scale will be covered more completely later in this paper.

Mechanical thinning is performed manually and usually employs the use of a power saw. Environmentally, this is the more attractive alternative of the two thinning practices in that it is safer than the use of chemicals. This method is especially more deserving of the two because it would allow the opportunity for employment of more people.

Commercial thinning has as its main objective to provide more adequate tree spacing and to concentrate on the trees left standing as future wood yield. The thinning process occurs according to the age, growth rate, and demand for a certain type of wood product. In comparing commercial thinning to precommercial thinning, commercial thinning requires logging equipment for the removal of the felled trees. The soil disturbance which occurs from the use of equipment can cause erosion since the use of such heavy equipment requires the building of "skid roads" as well as landing places. This results in exposure of mineral soil and can lead to soil erosion problems, thereby creating an adverse impact on water quality. Also the slash produced during commercial thinning can affect the water quality.

Clearcutting vs. Selection Cutting

Clearcutting is the complete removal of the timber stand over a given area in a single cut. This system requires the following intensive management practices:

1. Erosion control

2. In site preparation

3. Regeneration of new forest

Clearcuts range in size from a few to several hundred acres of land and are the most economical harvest method. Because almost all vegetation is removed from a given area during a clearcut, the site is therefore exposed to more hazards than before, such as loss of soil moisture and loss of soil by wind erosion. The slash must be treated to avoid damage to water quality and stream beds, fire hazard, and to minimize insect infestation.

The Selection Cutting system is comprised of two practices. They are 1) single tree selection and 2) group selection. Selection cutting may be necessary in some areas to provide soil protection in highly erodible areas. Single tree cutting is used to produce an increase in the shade bearing trees, while group selection is used to maintain the less shade-giving trees.

Proper harvesting methods are extremely important to ensure the maximum rate of return growth and as a management tool to see that an old forest can be returned into a stable, producing timber land.

While clearcutting involves the complete removal of stumpage in a single cut from a given area, the slash left from such removal produces the problems of water contamination and insect infestation. In this method, burning of slash often takes place. Slash burning wastes a needed fuel source, causes a certain amount of damage to the soil, and exposes the soil to the forces of erosion.

In selection cutting, which seems to be the more environmentally sound cutting practice, two methods are employed. Single tree selection is used to prevent soil erosion and to cut only certain species of trees (usually the non-shade bearing trees). Since this type of practice is what it implies, select cutting, often it is done manually. This increases job opportunities not only for cutting, but also for the collection of the slash left behind. Also, since there are some trees left standing, the soil disturbance is minimal.

Group selection is employed to cut the shade-bearing trees in order to maintain the less shade-giving trees. Again, the advantage is the increased prospect for job opportunities and for better soil protection.

As far as enhancement of the environment goes, selection cutting does not cause as much harm to the soil as does clearcutting. Selection cutting leaves a certain amount of trees standing, prevents soil erosion, reduces the wind removal of soil and aids in the regeneration of new stands.

LOGGING PRACTICES

Once a suitable means of harvesting has been established and has actually taken place, the next consideration is the method used for the movement of the logs from the stump (or point of felling) to a landing (or point of concentration). Care should be exercised in choosing the method. Consideration must be given to the impact on the land from building of roads and dragging of logs, all leading to soil erosion problems. Three types of logging methods are generally used--tractor, cable, and aerial. The use of the tractor method employs equipment with devices for reducing the contact between log and ground. Cable logging is a logging system using winches in a fitted position, and aerial logging is accomplished with the use of helicopters. Aerial logging is relatively new and is not as desirable as the others because as much as an acre of land must be cleared for the landing base. Weather conditions sometimes prevent helicoptors from flying, and the reforestation of the lands cleared in such a fashion can be hampered because of the lack of roads.

Once the logs have been removed from the site, a storage site must be selected. Several factors have to be considered in dealing with this situation. For sites that are not close to bodies of water, for the most part, the logs are free-fall dumped from trucks at specific land storage sites that have been cleared for just such purposes. Frequently, these land storage sites are used for both sorting and storage and can be used for supplying a nearby facility. Many of these land storage sites have sprinkling systems, and the waters from such sprinklings are drained into the natural drainage waters of the area. The extent of concentration of toxic substances from such a drainage are minimal. Consequently, water-based storage is more likely to have effects on the water quality.

Water storage is prevalent in the Pacific Northwest and coastal regions. Four types of log storage used in fresh waters are: 1) Sale dumping sites; 2) sale area raft collecting storage sites; 3) winter raft storage sites; and 4) mill storage and sorting sites.

Settling the logs into the water can be done by several methods. Some are bundled on land, lifted and lowered into the water using a crane; bundled on land and slid into water; lifted into the water individually, then bundled; or dumped on the beach, then bundled and slid into the water at high tide.

After the dumping of the logs, they are collected into rafts. These rafts are then usually transported by tugboat to a mill site.

SITE PREPARATION

Site preparation prior to planting or seeding is mandatory. This includes treatment of slash, while at the same time protecting the soil. Slash burning is a common practice as is the use of chemicals and mechanical procedures.

The burning of slash exposes the soil, thereby reducing the organic matter content and leading to surface soil erosion. Because of the residues left after harvesting, burning can indirectly affect water quality. This will be covered in the Water Quality Impact section of this paper.

Herbicides may be required in site preparation. The use of chemicals (excluding 2,4,5-T and 2,4,5-TP) is sometimes combined with the fire-burning method. When used in combination with fire-burning, the chemical site preparation method can be dangerous to the soil surface, wildlife, and water. Chemical application to forest lands for increased production has changed from one year to the next, but approximately 2 million acres may receive some type of chemical treatment in any given year. These chemical applications are broken down into three groups. The categories are: fertilizers (for increased fiber production); herbicides (for species selectivity); and, insecticides and rodenticides (for pest control). Each of these chemical treatments offer negative impacts when not properly or thoroughly monitored. Many of these forest chemicals have toxic properties even at low concentrations. The toxic hazard of a chemical is dependent not only on dosage, but also on level of exposure, duration of exposure, route and area of contact and the toxicity of the compound.

A toxic impact from fertilizers, for example, would generally require extremely large application rates. The primary concern for the improper use of these fertilizers is excess nutrient enrichment of surface waters due to either runoff or direct application to streams and lakes. This can result in heavy aquatic weed growth which could lead to oxygen depletion in the water, the killing of fish and related problems.

Application of these chemicals can be done by airplane (or helicoptor) or by ground application. The ground application method covers a smaller area and is considered to be the more reliable in reducing dangerous overdoses since it involves smaller amounts of chemicals covering smaller, more concentrated areas. The wide-range over-all dusting (or aerial application) of chemicals is by far the more predominant method. Aerial application usually results in greater impacts on water quality and wildlife health. (See Water Quality Impacts section.)

Regeneration by means of artificial reproduction is done by planting young trees or by planting seeds, called "direct seeding." Natural regeneration takes place from seedlings which originate by natural seeding of the stands (trees) that were there before cutting (harvest). Direct seeding may result in lower cost and the possibility of seeding over longer periods of the year.

The likelihood of survival is increased by planting young trees, even though labor and equipment are more costly. Therefore, planting is usually practiced much more than direct seeding and thought to be the best way of

ensuring regeneration. Planting stock is grown in nurseries, with transplanting taking place one or two years after seeding. Field planting is usually done by a hand-operation method. Preparation of proper planting holes makes the planting operation speedier and improves the quality. In areas with less steep slopes, machines are often used in planting.

For natural regeneration to be successful, the source of the seed (healthy, living trees) must be located appropriately to the area that needs seeding. The trees must be producing viable seed. Also, the size of the cut area, the type of soil, and the predominant wind direction are important factors in how successful the natural regeneration process will be. Leaving a natural seed source on the harvested (cut) area does not necessarily guarantee successful regeneration.

WATER QUALITY IMPACTS

Each method of timber production has an impact on water quality.

After harvest of the trees, the impact on water quality is usually caused by site exposure, soil disturbance, and the presence of forest residue. Soil disturbance occurs with all types of harvesting. Soil disturbance and compaction can be a problem, particularly on steep sites and erodible soils. (See Table 2) When large quantities of residue build up on the ground, such residue tends to collect in streams. This causes an increase of organic materials in the runoff water.

The burning of residue (slash) or of brush from old fields can indirectly affect water quality. Slash burning changes soil content in areas where burning is intense. These areas have exhibited changes in soil structure, decreases in wettability and loss of nutrients. When large areas are burned, this increases runoff, erosion, and nutrients lost to streams.

The impact of the actual logging activities on water quality is determined by the extent to which a harvested area is disturbed by the building of roads and by the method of the movement of logs to the landing site. Soil disturbance and surface erosion are increased, of course, by the use of heavy equipment such as tractors and trucks.

Bark and wood debris and soluble organic materials (leachate) are the two major wastes which affect water quality. Bark losses occur at several stages of log handling. The quantity that is actually deposited in water depends on the species of the trees, methods of handling, types of storage areas and the lengths of time of storage. The amounts of leachates (or water-soluble organic materials) in storage water is determined by the species of the trees, length of time in storage, water flow (or flushing action) in the storage area, the age of the logs at the time of harvest, and the amount of bark remaining on the logs when in water storage.

Several forest practices can introduce living and dead particles of vegetation into streams. Some of it moves through the streams very quickly, while some of it remains on the banks of the water source. In all cases, the materials eventually decay and can cause reduction of water quality by decreasing the dissolved oxygen in water and by releasing organic water-soluble substances.

Log or debris dams are common in the salmon spawning streams of Southeast Alaska, and affect streamflow and streambeds. Salmon production is reduced by gravel movement (which reduces egg survival) by log-debris dams caused by the change in the streambeds. It has been reported that when debris was not removed from a stream after logging, spawning salmon decreased by 75 percent because of the migration barrier.

Logging can increase the temperature of small streams. The removal of shade trees increases the amount of sunlight reaching the ground and water, raising the temperature of soil and water. The amount of the increase depends on the flow of the stream, the surface area that is exposed to the sunlight, and the amount of radiation received from the sun.

In a recent report published by the EPA, "priorities in water pollution control for a five-year period beginning in 1981" have been set out. "While minimizing the extent of pollution from forestry activities, the report does stress the need to maintain high-quality water in forested areas for water supply and fisheries protection...EPA's role in alleviating silvicultural pollution will primarily be to provide technical and financial assistance to federal and state agencies working on silvicultural non-point pollution problems."[11]

HEALTH HAZARDS & IMPACTS ON WILDLIFE

Because of the chemicals used in controlling production and slash in the forests, we must stress the importance of the types of chemicals used. When forests are treated with herbicides, the potential impacts are great. Wildlife that live off the vegetation that has been treated contract the toxicity of the chemical. This also occurs when wildlife drink contaminated water. Those animals that are consumed by humans transmit the toxicity to the humans. Accumulations of pesticides in forests can be so high as to be considered lethal to some individuals of a species itself and to some predators which feed on them.

During the course of a national budget hearing on March 3, 1980, Senator John Melcher (D-MT) requested a "freeze" on the use of the herbicide 2,4,5-T, and said such a freeze should be in effect until such time that conclusive reports are released proving that wildlife that might browse on sprayed foliage do not retain the chemical in their bodies or pass it on to the humans who hunt and consume such animals. Assistant Secretary M. Rupert Cutler (U.S. Department of Agriculture) stated that he didn't believe such a move (the freeze) would be a good idea because "1) what small amounts of 2,4,5-T the Department uses are applied in the spring, and herbicide residue would be washed off the foliage by hunting season; 2) the Department has already imposed strict limitations on the use of 2,4,5-T and he (Cutler) would not like to prohibit uses that are still allowed by EPA; and, 3) in some cases the chemical is important in protecting tree plantations from competition with competing brush." (Emphases added.) Fortunately Senator Melcher countered by pointing out that economics should not be a consideration in any decision regarding 2,4,5-T use so long as there are any doubts as to the chemical's effects on wildlife and humans.[12] Note the "wash off" term used in Assistant Secretary Cutler's statement. This again points up the possible pollution of waterway or streams and the effects of the chemicals on slash (remembering the 2,4,5-T toxicity and its effects on man and other living things).

The Forest Service fails to acknowledge the known impacts of high concentrations of 2,4,5-T, such as causing swelling of the extremities and eyes, discoloration of the skin, loss of hair, inability to talk or swallow, nose bleeds, inability to walk, and miscarriage of babies. In one incident reported by The Women's Center Committee on the Environment in Fayetteville, Arkansas, in a journal called Acres, U.S.A., "a field was sprayed with 2,4,5-T above a spring supplying twenty people; six out of eight babies conceived there were miscarried, one severely deformed with a cleft head and no legs." There is no documentation of this report in other literature, however.[13]

These and other incidents are causing the opposition to herbicide use to spread. People living in communities close to forest lands, and those who work in the forest planting, thinning, and cutting trees and brush are concerned about health impacts.

An organization called Citizens Against Toxic Sprays, Inc. (C.A.T.S.) has associated the use of 2,4,5-T, 2,4-D, and silvex in spring herbicide spraying with lung ailments, gynecological problems, spontaneous abortions and birth defects. However, it should be noted that these findings were from 1976-1978,

and at that time the Forest Service, U.S. Department of Agriculture, in each instance stated that, "No documentation or verification of this report is presented from scientific literature."

In 1970, nearly a billion pounds of some 900 registered pesticides were applied throughout the United States. This large quantity of pesticides was aimed primarily at about 2,000 pest species of plants and animals. As expected, many of the other 200,000 species of plants and animals present in the environment were either directly or indirectly affected by these widespread pesticide applications.[14] This amounts to about 5 pounds of pesticide applied per person for pest control.[15]

High levels of pesticides have been found in the atmosphere. In one instance, when aerial application was used, it was noted that of the pesticide released into the atmosphere above the crop, only approximatley 26 percent reached the crop, the other 74 percent remained in the atmosphere.[16]

Some pesticides remain in the environment for long periods of time. The advantage of this is that the pest control is effective for a longer length of time with fewer applications needed. The disadvantage is clear -- the longer the pesticides remain, the greater is the possibility that they will move from the treated area by either soil erosion, water flow, air or organisms and harm non-targeted organisms. This is a cause for a great concern.

In the use of pesticides, the following safeguards must be considered:

1. Insecticides require greater safety measures than herbicides (not to imply that herbicides are safe) since acute insecticide toxicity causes direct and immediate injury to water organisms and other non-target species.

2. Persistent insecticides (those that remain toxic for long periods) require greater safety measures also to insure against long-term effects.

3. Large streams are more susceptible to buildup of pesticides than small streams. Because the water in a large stream moves more slowly, its cleansing action takes longer. Small, fast-moving streams cleanse themselves more quickly and flush their contaminants into larger streams, where they accumulate and remain over longer periods of time, thus exposing aquatic species to greater harm. Greater safety precautions must be taken with larger streams.

CULTURAL IMPACTS

The term "cultural impacts" refers to the use of certain types of timber or forested areas by some tribes in their religious ceremonies and crafts. The land on which timber stands may have been designated as having religious meaning to a particular tribe.

The recent San Francisco Peaks ruling made by the U.S. Forest Service halting further development of a ski area located on the San Francisco Peaks near Flagstaff, reflects the concern over just such religious lands.[18] Although a representative of Northland Recreation, Flagstaff, Arizona, was shocked by the decision, she stated that "We do not suppress their (Navajo, Hopi and Zuni) right to express their religion. We let visitors to the sacred mountains ride up the ski lift, and go up there if they wish." The Forest Service emphasized the importance of the Indian Religious Freedom Act, stating that the "decision considered the rights of Native Americans and the general public as stated in the First Amendment to the Constitution which guaranteed freedom of religion."[19] The Regional Forester's decision in favor of the Indians is still under review by the Secretary of Agriculture.

Another consideration is that in spite of government health benefits provided to Indians, medicine men still make a vital contribution to the physical and mental health of Indian people as well as to their culture and religion. The use of herbs that grow wild in the forest for medicine is still practiced by some tribes. Two of the most widely used herbs are actually trees. Quoting the late Gabriel Polchies, a Malecite of Maine, "Indian medicines are safe..." Not so, if these herbs or trees have been treated with a pesticide or herbicide. Among the varieties of trees used in religious ceremonies today, oak is outstanding and used most commonly because it produces so little smoke.

Many tribes have customs that hold wildlife to be sacred. Certain species of wildlife are included in their cultural beliefs and are a vital part of their proud heritage. For instance, eagles and bears are considered by some tribes to be of special significance and their protection should be an important concern in forestry management.

HELP WANTED-MANAGEMENT

"Federal Indian Policy is much like Columbus. He didn't know where he was going. When he got there, he didn't know where he was. And when he got back, he didn't know where he had been."[21]

Anonymous

According to a General Accounting Office (GAO) report, the trust responsibility of the Federal government for Indian forest resources, as supervised and maintained by the Bureau of Indian Affairs, has not been diligently and effectively carried out. (Emphasis added.) "Indian forest lands are managed less intensely than the Government manages its own national forest properties and compares even more poorly with management of industrial tree farms."[22]

The economic potential of Indian timber is tremendous, and we cannot over emphasize that timber is a renewable resource.[23]

The need for the development of an indepth forestry management program for Indian country is obvious and it is of the utmost importance that it be under tribal management and control. The Administration is hampered by the lack of goals or objectives in forestry development--and sometimes, it seems, by a lack of interest. "It (the BIA) is also not in the position to manage all the tribes' resources...only the tribes should determine their goals and only the tribes can oversee the exploitation of all reservation resources...the BIA does not have the direct interest in the enhancement of tribal resources which tribal members have. Due to the poor reputation of BIA forestry and the lack of opportunity for advancement, it is almost impossible to recruit highly qualified personnel to BIA forestry management. A vicious circle of poor performance results in perpetuating tremendous losses for tribes as timber resource owners which results in perpetuating a dependency economy."[24] (Emphasis added.)

The past mismanagement of Indian forests by the Bureau of Indian Affairs is well documented. It underlines the necessity for the tribes to develop their own expertise in forestry management if for no other reason than to "watchdog" their trustee. That is not the best reason, however. The best reason for tribes to control the development of their own timber and related industries is because it is theirs. They are the people who will live with or without the economic benefits, the environmental and/or health impacts, the jobs and last but not least, the beauty of a healthy, productive forest. The tribes themselves have the option of limiting or expanding their timber industry. The Federal government has a responsibility for assisting tribes to meet their own goals in this regard. This must include the option for tribes to contract for certain management functions while maintaining the trust relationship. It also means that the Bureau of Indian Affairs must increase their own capabilities in this area in order to enhance rather than impede the growing sophistication of the tribes in controlling the development of their own resources.

SILVI - WHAT? - A SUMMARY

Indian tribes own substantial timber resources. If properly managed, Indian forests will yield significant revenues for tribes and could be developed as a useful renewable energy supply. Timber sales now supply 25 to 100 percent of tribal revenues for approximately 57 Indian reservations. Forests are a renewable resource, and their potential for timber production, fuel supply, watershed management and wildlife management has never been fully utilized.

Forests are more than simply stands of trees waiting to be cut. They provide habitats for wildlife and human communities, they protect the soil and watersheds that supply us with good food and water, and they create scenic surroundings for people to live near. The qualities must be protected while the resources of lumber and fuel are being exploited and developed.

Timber production results in several environmental and health impacts. The most serious is its impact on water quality. The use of chemical sprays (fertilizers, herbicides, insecticides and rodenticides) for precommercial thinning and for site preparation (clearing away slash and undergrowth) has certain advantages but also can pollute water supplies with toxic chemicals that create harmful effects in humans and wildlife. Water quality is also affected by the type of cutting method selected. Clearcutting can leave a slope bare and unprotected allowing wind and rain to wash soil and debris into water sources. When streams become muddy and high in organic matter content, the oxygen supply in the water is reduced, thus threatening any fish and aquatic life in the stream or river. Selection cutting (removing smaller groups of trees) creates less impact on water quality, but can be more expensive.

The method chosen for treatment of slash also affects water and soil quality. Chemicals are often used to prevent insect infestation in the slash, but this can run off into water supplies, especially if applied aerially. An alternative is to burn the slash but this wastes a potential fuel source and can damage the soil.

Removal of logs from a forest also creates water quality impacts, mainly by contributing to erosion and sedimentation of streams. Logging roads cut haphazardly up steep slopes can cause serious erosion problems. Log storage sites on land often use sprinkler systems to keep the wood from drying out. These result in a minimal impact by washing toxic chemicals from the wood and bark into water sources. More serious impacts from toxic chemicals can occur when logs are stored in water, such as rivers, lakes or coastal waters.

Timber production also results in occupational hazards. The most obvious is the risk to individuals involved in cutting the trees, driving the trucks and handling the logs. Another impact which must be considered is the hazard to community members from logging truck traffic through inhabited areas.

Tribes need to be aware of potential cultural and religious impacts from forestry practices. Certain areas may have special significance, and certain species of plants or animals may need to be protected for use in religious ceremonies.

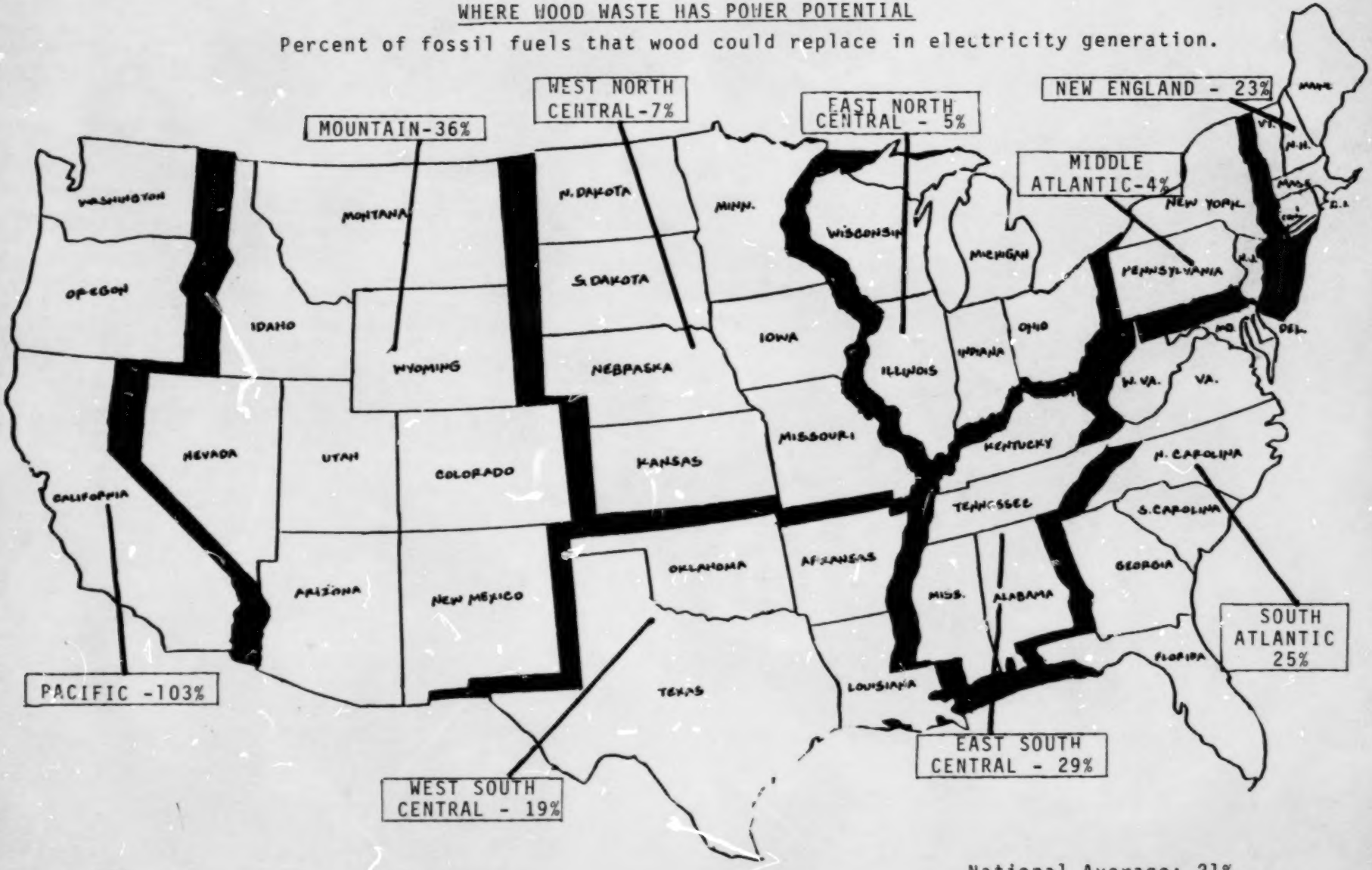
Another impact to be considered is the destruction of the scenic qualities of forested lands. The recreational uses of forest lands can be harmed by improper forest management. Here the choice of cutting methods (clearcutting vs selection cutting) is an important ingredient in determining the extent of scenic degradation.

Silviculture (the development and care of trees; the art of producing and tending a forest) is an important kind of development among Indian tribes. It must be practiced properly, with due consideration of potentially adverse environmental and health impacts, with sensitivity to religious and cultural values, and using methods that insure that the forests will remain a renewable resource.

TABLE 1

WHERE WOOD WASTE HAS POWER POTENTIAL

Percent of fossil fuels that wood could replace in electricity generation.



National Average: 21%

Business Week, 3/15/76

RELATIVE EROSION HAZARD OF LOGGING AREAS
IN RELATION TO SITE FACTORS

Site Factors	High Erosion Hazard	Moderate Erosion Hazard	Low Erosion Hazard
Parent rock	Acid Igneous	Sedimentary and Metamorphic	Basic Igneous
	Granite, diorite, volcanic ash, pumice, some schists	Sandstone, schist, shale, slate, conglomerates, chert	(Lava rocks) Basalt, andesite, serpentine
Soil	Light textured,[a] with little or no clay	Medium textured with considerable clay	Heavy textured, largely clay and adobe
Mantle stability	Unstable mantles (cutbank stability Class V)	Mantles of questionable stability (cutbank stability Class IV)	Stable mantles (Classes I, II and III
Slope	Steep (over 50%)	Moderate (20-50%)	Gentle (0-20%)
Precipitation	Heavy winter rains or intense summer storms	Mainly snow with some rain	Heavy snow or light rain
Vegetation and other organic matter on and in the soil	None to very little	Moderate amounts	Large amounts

[a] Soil texture refers to the size and distribution of the mineral particles in the soil, the range extending from sand (light texture) to clay (heavy texture).

TABLE 3

SEVERAL FACTORS THAT CAN AFFECT THE DEGREE OF CHEMICAL IMPACT	
Increased Impact	**Decreased Impact**
Steep slopes	Infrequent application
Disturbed soils	Continuous ground cover
Application upstream from water users	High water dilution rates
Frozen soil during spring runoff	Low percentage of area treated
Thin soils	Porous soils
	Minimum surface runoff

Forest Chemicals and Water Quality, 1978
Environmental Protection Agency
Region X, Seattle, WA 98101

TABLE 4

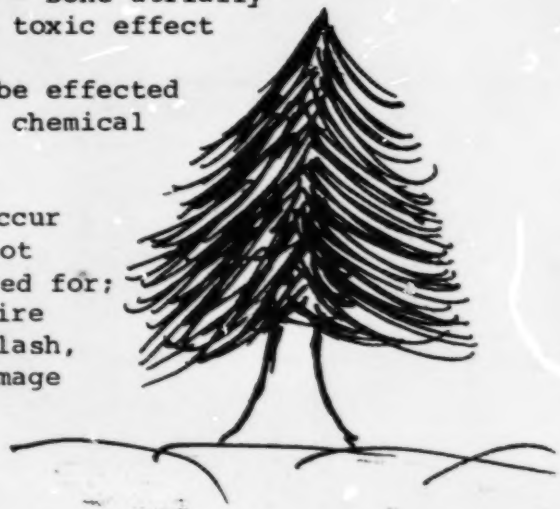
ENVIRONMENTAL IMPACTS

1. Slash - Residue left after felling trees - fuel/fire hazard

2. Chemical Application - Done aerially or manually, toxic effect

3. Water Quality - can be effected by slash and chemical application

4. Soil - Erosion can occur if soil is not properly cared for;
   - the use of fire to control slash, can cause damage to top soil



ENDNOTES

1. Cecil D. Andrus, Secretary of the Interior, U.S. Dept. of Interior Conservation Yearbook No. 12 - 1978/79 Living With Our Environment, p. 2.

2. Forest Chemicals and Water Quality, Environmental Research Information Center, EPA, Region X, Seattle, WA., 1978.

3. Comptroller General, Report to the Committee on Interior and Insular Affairs, United States Senate, Indian Natural Resources --- Opportunities for Improved Management and Increased Productivity, Part I: Forest Land, Rangeland, and Cropland, (1975). These figures exclude Alaskan forest lands, p. 1.

4. Survey Report on Economic Development on Indian Reservations, General Accounting Office (Report 14555), Washington, D.C., June 1973, p. 58.

5. People and Energy, August 1976, Vol. II, No. 8, p. 2.

6. Forest Service Timber Sales: Their Effect on Wood Product Prices, Congressional Budget Office, Congress of the United States, Background Paper, May 1980, Summary p. xi.

7. American Indian Policy Review Commission, Final Report, 93d Cong., 2d Sess., Vol. 1 at 324 (1977). (Hereinafter referred to as AIPRC Final Report.)

8. AIPRC Final Report at p. 324.

9. Comptroller General, Indian Natural Resources, p. 24.

10. Comptroller General, Indian Natural Resources, p. 26

11. American Forests, Vol. 86, No. 4, April 1980, p. 10.

12. Ibid., p. 8.

13. Herbicide Spray - Fact Sheet, Anon., February 1975, as quoted in Vegetation Management With Herbicides, U.S.D.A., 1978.

14. Ecological Effects of Pesticides on Non-Target Species, Executive Office of the President, Office of Science and Technology, June 1971, p. 1.

15. Ibid., p. 177.

16. Ibid., p. 181

17. Forest Chemicals and Water Quality, EPA, Region X.

18. The Gallup Independent, Gallup, New Mexico, February 22, 1980.

19. Ibid.

20. The Nishnawbe News, Vol. 8, No. 1, October 1980.

21. "You Don't Have To Be Poor To Be Indian", Gover, Maggie, Americans for Indian Opportunity, Albuquerque, New Mexico, 1980, p. 21.

22. AIPRC Final Report, p. 325.

23. AIPRC Final Report, p. 327.

24. AIPRC Final Report, p. 327.

BIBLIOGRAPHY

American Forests, "How Can You Plan Without Goals?", Vol. 86, No. 8, August 1980.

American Forests, "Washington Lookout", Vol. 86. No. 4, April 1980.

American Indian Policy Review Commission, Final Report, 93d Cong., 2d Sess., Vol. 1. (1977).

Cohen, Felix, Handbook of Federal Indian Law, University of New Mexico, Albuquerque, New Mexico.

Ecological Effects of Pesticides on Non-Target Species, Executive Office of the President, Office of Science and Technology, June 1971.

Forest Chemicals and Water Quality, Prepared by the EPA, Region X, Seattle, WA., 1978.

Forest Harvest, Residue Treatment, Reforestation and Protection of Water Quality, U.S. Environmental Protection Agency, Seattle, WA., April 1976.

Forest Service Timber Sales: Their Effect on Wood Product Prices, Background Paper, Congress of the United States, May 1980.

General Accounting Office, Survey Report on Economic Development on Indian Reservations, GAO Report 14555, Washington, D.C., June 1973.

Gover, Maggie, You Don't Have To Be Poor To Be Indian, Americans for Indian Opportunity, Albuquerque, New Mexico, 1980.

People and Energy, August 1976, Vol. II, No. 8.

Report to the Committee on Interior and Insular Affairs, United States Senate, By the Comptroller General of the United States, Indian Natural Resources ---Opportunities For Improved Management and Increased Productivity, Part I: Forest Land, Rangeland and Cropland, Bureau of Indian Affairs, Department of the Interior, RED 76-8, August 18, 1975.

United States Department of the Interior Conservation Yearbook No. 12, 1978/79 Living With Our Environment.

Vegetation Management With Herbicides, Final Environmental Statement, Volume 1, Pacific Northwest Region, U.S. Forest Service, U.S. Dept. of Agriculture, 1978.

BLANK PAGE
DO NOT FILM